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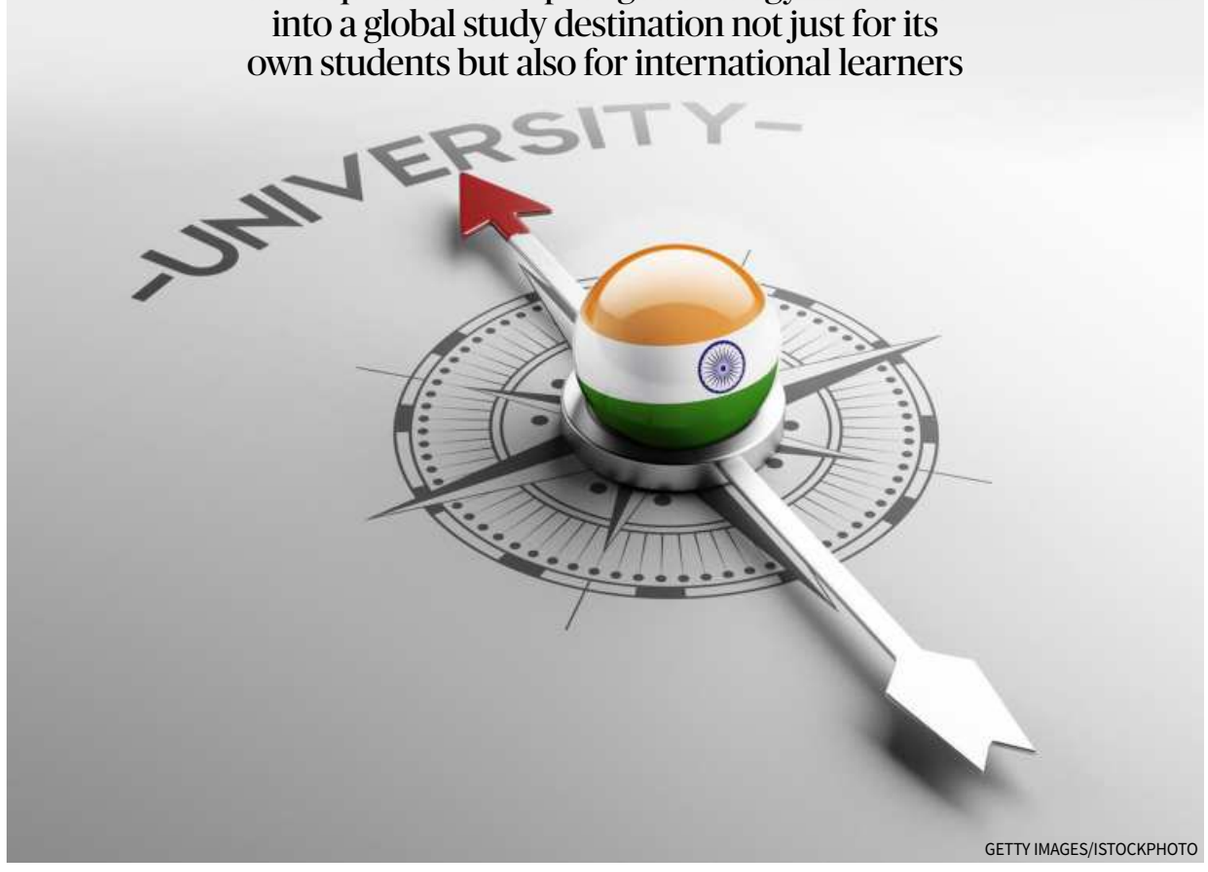
From brain drain to brain gain

India requires a multi-pronged strategy to transform into a global study destination not just for its own students but also for international learners



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V Ramgopal Rao

The recent *Open Doors Report 2024* revealed a telling trend: India has become the largest source of international students in the U.S.; with a record-breaking 3,31,602 students enrolled in 2023-24. Indian students pursuing higher education abroad are making substantial financial contributions to international economies. In 2022, their direct spending – encompassing tuition fees, housing, and living expenses – was estimated at approximately $47 billion. This figure is projected to escalate to as much as $70 billion by 2025.

While this reflects the ambition and global outlook of India's youth, it raises an important question: Why are so many of India's brightest minds compelled to seek education abroad? India aspires to emerge as a global leader in education and innovation. Yet, the student exodus underscores significant challenges in our higher education ecosystem. The answer lies in transforming India into a global study destination; not just for our own students but also for international learners. This transformation, however, requires a cohesive, multi-pronged strategy addressing education quality, financial sustainability, institutional autonomy, and capacity building.

Diversified financial model

The core challenge lies in India's disproportionate reliance on tuition fees in privately funded institutions and government grants in public-funded ones as the primary sources of revenue. In globally renowned universities, tuition fees contribute only 15-20% of the total revenue. In a stark contrast, Indian institutions often rely on tuition for over 80% of their funding. Similarly, government-funded institutions draw nearly 90% of their revenue from public funds. Both models are unsustainable and lack the scalability required to meet the growing demands of the education sector.

Ideally, tuition fees should contribute only 30-40% of total revenues. A sliding fee structure, coupled with merit-based scholarships funded by endowments, can help ensure access to quality education without compromising affordability. Endowments, a mainstay of global universities, should form 30-35% of the revenue base. Encouraging philanthropy from alumni and corporate donors, supported by favourable tax policies and streamlined regulations, is essential to building these endowments.

Additionally, research overheads can contribute 20-25% of revenues through industry-academia collaborations and global research grants. By prioritising applied research that addresses real-world challenges, institutions can generate funding while making meaningful contributions to society. The remaining 10-15% of revenues can come from alternative sources such as executive education programmes, intellectual property commercialisation, and investments in start-ups.

This balanced approach reduces the financial burden on students while ensuring that institutions have the resources to invest in research, innovation, and global competitiveness.

Capacity and quality

Financial sustainability is only one piece of the puzzle. Scaling capacity and enhancing quality are equally critical. The government alone cannot meet the growing demand for higher education.

Public-private collaboration is central to this effort. Private institutions, supported by Public-Private Partnerships (PPPs) and Corporate Social Responsibility (CSR) initiatives, must play a greater role.

India needs to establish new world-class universities while upgrading existing ones with state-of-the-art infrastructure. A vibrant research and innovation ecosystem must be built by fostering industry-academia partnerships, increasing R and D funding, and creating mechanisms for monetising intellectual property. Flexible, interdisciplinary academic programmes aligned with global standards can further enhance the appeal of Indian institutions.

To improve the diversity and quality of education, Indian universities should actively recruit international faculty and forge global academic collaborations. Such measures would not only raise the global profile of Indian institutions but also expose students to a truly international learning environment.

Autonomy and accountability

An enabling policy environment is essential to drive these reforms. Institutional autonomy, as emphasised by the National Education Policy (NEP) 2020, is a cornerstone of this transformation. Universities need the freedom to innovate in curriculum design, resource allocation, and partnerships with global institutions. Autonomy empowers institutions to respond dynamically to changing global and domestic needs, aligning strategies with global benchmarks.

Government policies must also encourage the creation and growth of endowments. Substantial tax benefits and flexibility in fund management can incentivise philanthropy. However, with autonomy must come accountability. Independent audits and professional fund management practices should be mandated to build stakeholder trust and ensure transparency.

Globally, universities are moving toward zero-tuition models sustained by endowments and research revenues. India, too, must aim for a future where quality education is universally accessible, rather than an aspirational privilege.

With these measures, India can reverse the brain drain and position itself as a global hub for education. The goal is not merely to retain Indian students but to attract learners from around the world. The time to act is now. By taking bold, transformative steps today, we can ensure that India's brightest minds not only stay but thrive, and that global talent aspires to call India their alma mater.

Views expressed are personal.

The writer is Vice Chancellor, BITS Pilani Group of Institutions, and former Director, IIT Delhi.

OFF THE EDGE
Nandini Raman

Stay positive

Uncertain about your career options? Low on self-confidence? This column may help

I have graduated in Naval Architecture and Ocean Engineering. What are the career opportunities? Should I take the GATE? Sailesh

Dear Sailesh,

There are some good opportunities across core industries in shipbuilding and repair, offshore engineering, marine hydrodynamics, marine structures, and ocean engineering. You can explore maritime consultancy, academia, research and development, and government agencies like the Indian Navy, Coast Guard, or port authorities. A good GATE score can boost your career prospects and open doors to M.Tech. programmes and PSU jobs in shipping, defence, and oil and gas sectors. Consider gaining practical experience and develop your technical skills through internships and industry projects. Build relationships with industry professionals to learn about the latest trends and job opportunities.

I am in Class 12 (Science). My Physics is weak but I took Science because my parents insisted. I am a History enthusiast and wish to be an archaeologist but I am uncertain about job opportunities. I am preparing for the engineering entrance exams but am not sure I will be a good engineer even if I clear the exams. I also want to prepare for the UPSC. I feel stuck and confused. Aachal

Dear Aachal,

Is it possible to talk to your parents and share your disinterest in Physics and Engineering? Could a teacher at school or a relative or family friend mediate this difficult conversation? It is important that they understand this now and not force you into a stream that you dislike. If this doesn't work, ask to meet a therapist or career counsellor as soon as possible. Your passion for history is a great foundation for a career in Archaeology. A B.A. in History or a related field can lead to careers in museums, heritage organisations, or research institutions. Interdisciplinary fields like Archaeological Science (a combination of Archaeology and sciences such as Chemistry, Physics, and Geology) or Heritage Conservation (preserving and restoring historical sites and artefacts) are also interesting. These will also help you with the UPSC or State PSC exams. Other job opportunities exist across academia, teaching, research, journalism, content writing and so on. Have a productive conversation with your parents as that will help alleviate your stress. Stay positive and make time for hobbies, exercise, and relaxation.

I am in Class 12 and overwhelmed by the vast number of options available. I am interested in filmmaking, especially cinematography, but my parents want me to do a "useful" degree. But I don't want to study something I am not passionate about. I like science, films and reading. Anbuselvan

Dear Anbuselvan,

It is important to balance your passions with practical considerations. Explore film-related courses and research film schools in India and abroad, their courses and specialisations various aspects of filmmaking. Media and Mass Communication courses provide a broader understanding of the industry. A degree in Fine Arts also can enhance your creative skills. Consult a career counsellor to assess your strengths, weaknesses, and core interests. Talk to filmmakers and get first-hand advice and guidance.

What course do your parents think will be "useful"? Talk to them about your interests and shortlist an academic path to get there. Could a "useful degree" in Sound Engineering, Electronics or Computer Science Engineering be good enough? This will be very useful in the technical aspects of filmmaking, visual effects, and sound design. Will this interest you? Do you have a portfolio to showcase your passion? Have you worked on short films, photography, or other creative projects? If not, then maybe consider a "useful" degree for the immediate future and pursue your passion later.

My son took a gap year in 2019-20 after completing his Class 12 (CBSE; Science with Computer Science). In 2020, he joined a college in Ireland to pursue B.E. (Mechanical). He couldn't complete three modules in his second year. After this he dropped out and returned to India. Are there any short-term job-oriented courses he can do? Senthil

Dear Senthil,

Have your son meet a career counsellor to understand what would he like to pursue both academically and professionally. What are his interests? Do they align with his passions and also develop skills that the current job market demands? The course he signs up for now should help him achieve his long-term career aspirations.

If he's looking for a technical job-oriented course, he can choose a short-term one in CAD, CAM, CAE to get an edge in the manufacturing industry or PLC, SCADA, or robotics for jobs in automation and manufacturing or courses in solar, wind, or hydro energy that will align with the growing green energy sector or Heating, Ventilation, and Air Conditioning programme. Specialised courses in automotive design, engine technology, or electric vehicles may be beneficial for opportunities in the automobile industry and certification courses in ISO standards and quality management systems.

If he prefers non-technical ones, he can consider Project Management, Digital Marketing, Business Analytics or Software Development (coding and programming languages such as Python or Java open up opportunities in software development). Internships or projects will help him gain practical experience and build a strong professional network to find a suitable job.

Disclaimer: This column is merely a guiding voice and provides advice and suggestions on education and careers.

The writer is a practising counsellor and a trainer. Send your questions to eduplus.thehindu@gmail.com with the subject line Off the Edge

Archana Subramanian
(archana.subramanian@thehindu.co.in)

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A friend, not a foe

A freewheeling conversation with Santiago Iñiguez, president, IE University, Spain, on education in the age of AI

What are the challenges that educational institutes face with the rise of Artificial Intelligence (AI)? What is the role of educators in this world of rapidly changing technology? A 500 Global LinkedIn Influencer, Santiago Iñiguez de Onzoño, the President of IE University, Spain, talks about the various aspects of education in the age of AI.

How does an institution evolve its curriculum to keep pace with the rapidly changing landscape of technology and AI?

Organisations, both in business as well as in education, tend to be quite conservative and reluctant to change. That said, universities must be flexible as they are regarded as the cradle of innovation and knowledge. They can keep traditions but must also introduce governance systems and decision-making processes that favour innovation and change. There has been criticism of universities being ivory towers because, sometimes, the research systems and the way faculty are recognised, incentivised and paid favours the academia. So, we have to introduce several changes in the governance to align with the incentives of faculty and make them closely connected with their respective professions.

What are the critical skills that students must acquire to succeed in this AI-driven world?

We should foster our reading and writing skills in the age of AI or we will lose an important part of our cognitive skills. But, if we think about generic skills, I would say critical thinking is particularly important to foster innovation. Exposing students to different forms of assessment, not just the typical essays or multiple choice exams, but oral assessments where they can improvise, showcase creativity, think outside-the-box or even without one... While AI is going to offer many improvements, we also need to enhance and foster traditional skills that make individuals stand out as human beings.

When it comes to AI, how can an institute balance theoretical knowledge and hands-on practical experience?

The mission of universities is not just to train students to join a particular job, but to train them into committed global citizens. Students should also be taught civic virtues, making them more sociable, interactive, understanding of fellow human beings by learning from different cultures and even learning new languages. There are some things that universities provide that you cannot learn in the workplace. Having said this, we also need to bring research and teaching at universities closer to reality.

At IE, for example, technology is part of our learning process. We believe it is a friend, not a foe, and train our students to face and navigate this new world. We are the first partner of OpenAI in Europe. We are now distributing the licenses of ChatGPT to our faculty and will do that for our students very soon. We are also developing AI tutors to help our students in an empathetic way.

How important is interdisciplinary education? Why is collaboration across different fields necessary?

I think it is essential. Innovation, in most cases, lies at the boundaries of disciplines. I always use an analogy to illustrate why this generalistic approach to education produces more entrepreneurs and entrepreneurial spirit. Look at two different systems. The one prevalent in Europe is discipline-oriented, created mostly in the 19th century. Basically, the idea is that professionals and students begin to specialise from year one. So for instance, they become mining engineers from the first year of their studies and they go deeper.

The system in the U.S. is different. Most students start with Liberal Arts course or a programme focused on the Humanities. This fosters a generalistic approach. Then, the second phase is of specialisation. Which of the two systems fosters more entrepreneurs? The answer is the one that combines a generalistic approach along with a specialisation afterwards.

What is the role of higher education in shaping the future of AI?

I believe that education is the major engine to transform societies. As an institution, we want to foster education across all geographies and bring participants who are talented from different cultures and produce entrepreneurs, global citizens and competent professionals committed to changing the world for the better. Universities should become universally accessible.

We are strengthening our scholarship programmes to bring talent from many different quarters. Our role as universities is, on the one hand, preparing those global citizens who transform the world for the better. Second is producing knowledge and research that helps the different professionals in their respective fields and industries.

Make a mark

Common mistakes to avoid in a resume and to make a good first impression

FREEPIK

Rajiv Krishnan

In the competitive world of campus placements, a resume is often the first impression. A well-crafted resume can help land that dream job. But even small mistakes can hurt one's chances. Here are some common errors and tips to avoid them.

Length
Many students create lengthy resumes but HR managers typically spend less than 30 seconds scanning each one. So, keep your resume to one page unless you have substantial and directly relevant experience. A concise resume forces you to highlight only your most impressive qualifications.

Key information
The 'top fold' refers to the upper third of a document. Structure your resume so that the most crucial details are visible in this section. Capture the attention of recruiters and encourage them to keep reading with an uncluttered and well-organised resume.

Achievements
Highlight achievements, not responsibilities, on your resume. This demonstrate performance and impact, while responsibilities merely outline expected tasks. Highlight how your accomplishments positively contributed to the company's performance. A common mistake is to not use any quantifiable data. Wherever possible, quantify your achievements in terms of money, numbers, or percentages. For instance, instead of saying "excellent team leader", you could say "achieved a 97% team satisfaction rate."

Objective statement
A vague objective statement such as "Seeking a challenging role in a dynamic company" serves no purpose and doesn't tell the recruiter what makes you unique. Customise objectives to reflect the specific job you're applying to. Mention the role, your skills, and how you can add value.

Grammatical errors
Spelling and grammatical mistakes give the impression that you don't pay attention to detail.

A survey conducted by CareerBuilder found that 77% hiring managers rejected resumes due to such errors. Review your resume, ask a trusted person to do so, and use online tools to catch errors.

Keywords
Many companies now rely on Applicant Tracking Systems (ATS) to filter resumes. If your resume lacks relevant keywords, it will make it less likely to be noticed by recruiter. Customise your resume for each job application. Use keywords from the job description and industry-specific terms to beat the ATS.

Relevant projects
List relevant projects, showcase your practical experience, demonstrate your skills, and highlight your accomplishment. Communicate to recruiters that you have hands-on experience in real-life situations and possess the practical skills needed for the job.

Social media
Many recruiters check LinkedIn or other professional profiles after reviewing the resume. An incomplete or inactive profile can raise doubts.

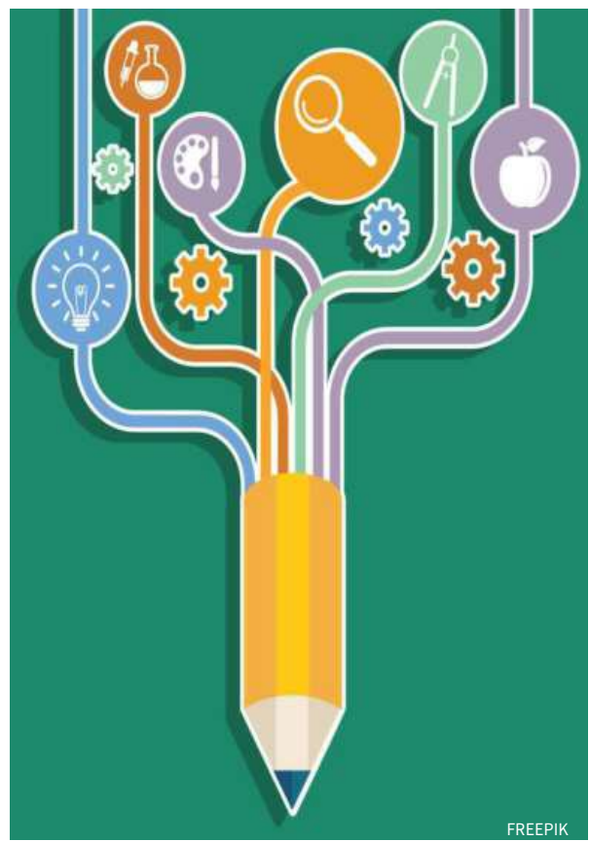
Make sure your LinkedIn profile is up-to-date and consistent with your resume. Highlight achievements and seek endorsements to strengthen your profile.

Contact information
Providing outdated phone numbers or email addresses can cost you a job offer. This is commonly overlooked by candidates, as often the resume you're writing is a revision of an old one. Verify all your contact information and use a professional email address.

The writer is MD and CEO of Ma Foi Strategic Consultants.

To synthesise diverse ideas

While a multidisciplinary learning is used in different subjects, what is required is an integrated approach that compels students to combine all these learnings.



FREEPIK

J.S.V. Lakshmi

Once, a group of blind monks encountered an elephant in the woods. Eager to understand this gentle giant, each monk touched a different part. One, feeling the trunk, exclaimed, "It's a snake." Another, grasping a leg, declared, "No, it's a tree," A third, touching an ear, insisted it was a fan. The monks kept arguing while touching different parts of the same elephant. This simple parable illustrates how each monk's conclusion stemmed from their limited experiences and perceptions.

Like the monks in the story, our problem-solving approach often relies on our limited experiences, logical understandings, and gut-driven "feelings". Such narrow viewpoints can lead to messy situations if our choices yield unfavourable outcomes. One way to make "good" rational decisions is to look at a problem as a whole and from all possible viewpoints. Our educational systems and teachers can do much more to help students cultivate such an approach.

Integrated approach
A multidisciplinary approach not only draws from a broad spectrum of knowledge and beliefs to comprehend and resolve issues but also facilitates sound, ethical decision-making. While it is true that our current educational systems already take a multidisciplinary approach in the form of various subjects taught, what we lack is an integrated approach that compels students to combine all these learnings.

A technique to implement this concept of bringing together diverse subjects for a cohesive and holistic viewpoint is through academic projects. Currently, most projects that are rolled out as part of the annual academic year are driven by individual faculties who customise projects based on their particular subject needs. Though this approach has its own merits, it limits students from expanding their thinking by connecting various subjects. Besides, students are seen to be disengaged by sheer number of subjects and volume of work.

Multifaceted project
A more efficient way to channel energy and cultivate holistic thinking is to let teachers from across subjects collaborate and carve out unique and interesting projects that let students think from different angles and work with their classmates in groups. At the beginning of each academic year, teachers from various subjects could collaborate to create a single multifaceted project, evaluating students based on their ability to integrate diverse areas of learning. Consider the popular volcano eruption model project. Traditionally, it might be assessed solely by a Science teacher. However, a multidisciplinary approach would involve evaluation across several domains:

- Science faculty assessing the model's accuracy and innovative aspects
- Social Science teachers evaluating the geographical and historical context
- Maths instructors focusing on measurements and calculations involved
- Languages teachers considering the quality of written and oral presentations

The objective of such projects is to enable students to apply a wide range of knowledge, honing their skills incrementally.

Another example is the Plant Growth Analysis project, which naturally incorporates elements of Biology, Chemistry, Maths, presentation skills and so on. Furthermore, assigning these projects to groups rather than individuals can yield additional benefits. Each student can bring a unique perspective to the task and also grasp the nuances of teamwork, conflict resolution, project management, and the art of leveraging individual strengths for collective success.

In conclusion, be it corporate, entrepreneurship or even government services, our world has become more vulnerable and unpredictable yet interconnected. Hence, it's time for education systems to evolve and let our students prepare for the future. By encouraging them to learn and apply a multidisciplinary holistic approach, students can "connect the dots", and solve problems in an increasingly complex world. As educators, our duty extends beyond imparting knowledge; we must nurture minds capable of synthesising diverse ideas to forge innovative solutions for a better tomorrow.

The writer is a retired Assistant Commissioner of the Kendriya Vidyalaya Sangathan.

Towards zero defects

Aniruddha Banerjee, Co-founder of SwitchOn, a vision AI inspection company, on his domain

SPECIAL ARRANGEMENT

FUTURE PERFECT
Ananya Ganapathy

Beginning a new column featuring conversations with entrepreneurs, technologists and researchers about emerging technologies and what students need to know about these fields

What do you do?

I am an entrepreneur and Co-Founder at SwitchOn, where I lead Business Development and Strategy. My academic foundation is Engineering. I have a B.Tech in Electronics and Communication Engineering from NIT Durgapur.

Why is your work important?

Large, global automotive manufacturers and FMCG companies face significant financial losses when defective products reach consumers. Our mission is to help these companies achieve zero defects with AI-powered Quality Inspection Systems, thereby ensuring operational excellence and high customer satisfaction through AI solutions.

What is exciting about your work?

Developing systems that automatically detect defects on manufacturing lines. Our ultimate goal is to create self-operating manufacturing plants, where the processes are seamlessly optimised, and defects become a thing of the past.

What was your inspiration to start SwitchOn?

In my previous job, I saw a product being developed from a concept on a whiteboard to reaching the hands of the customers. I also saw first-hand the issues of slow, inefficient, manual quality inspection. So, we wanted to enable manufacturers reach zero defect with AI.

Any experiences in college that led you to become an entrepreneur?

I actively participated in various clubs, such as CCA and competitions where I developed new projects like club websites and collaborated with fellow members to build Robots. Leadership roles in clubs and as head of the Training and Placement Cell enabled me to influence peers, secure sponsorship and placements. This early "selling" experience laid the foundation to build products for large organisations like NVIDIA and founding SwitchOn.

What should students know about your field?

The applications of AI: From Large Language Models (LLMs) to real-time systems, AI is transforming industries at an unprecedented pace.

Basics of programming: Mastering a high-level programming language such as Python is crucial to unlocking opportunities in the field.

The writer is an avid follower of emerging technologies and their applications.

New skill sets needed

Specialised skills and advanced educational initiatives are essential to harness the potential of mainframes in the age of AI

GETTY IMAGES/ISTOCKPHOTO

Kannan Subbarayan

As we navigate the rise of Artificial Intelligence (AI) in IT, mainframe technology remains critical. Once viewed as legacy systems, mainframes now play a vital role in Hybrid IT environments, supporting essential applications across sectors such as banking, healthcare, and government. However, for mainframes to remain competitive, we must bridge a notable skills gap, one that is compounded by rapid digital transformation and evolving industry needs.

To meet the demands of Hybrid IT, an enhanced focus on mainframe education is essential. Here is why fostering specialised skills and encouraging advanced educational initiatives is critical to thrive in this field.

New requirements
As AI enhances mainframe capabilities, traditional mainframe expertise and advanced AI-driven skills are required. This new skill set encompasses machine learning, data analysis, cybersecurity, and generative AI integration and requires an interdisciplinary approach where mainframe experts not only handle legacy systems but also manage and optimise AI-powered processes, using tools to modernise applications for the cloud. To address this, mainframe education must expand beyond foundational knowledge to include training in AI integrations, Hybrid IT architecture, and secure coding practices.

Universities and technical institutes play a crucial role in preparing students for a career in mainframe technology. While traditional programming and IT management remain important, there is a growing need for partnerships with tech organisations to introduce advanced mainframe courses. Collaborative programmes such as IBM's Academic Initiative offer hands-on experience and tailored certifications for students to acquire theoretical knowledge and practical skills.

Moreover, institutions could enhance curriculums by including industry-led workshops, simulations, and real-world case studies. In doing so, they equip students with applied skills in areas such as mainframe application modernisation and Hybrid IT integration, bridging the gap between academia and industry expectations.

Technology has redefined educational delivery methods. Virtual labs, interactive simulations, and AI-driven tutoring platforms are reshaping how students engage with mainframe technologies. Online certification programmes such as those offered by IBM, Coursera, Interskills and BMC make it easier to gain credentials in specialised areas such as mainframe administration and AI-powered system management. Additionally, advanced learning platforms incorporate gamification to make learning more engaging, especially for complex topics such as mainframe security and hybrid cloud management.

Tools and certifications
Digital tools also facilitate remote internships and mentoring programmes. For example, BMC Software's DevOps initiatives integrate mainframe training into development processes, enabling students to practice real-world mainframe applications and collaborate on virtual projects with industry experts. By harnessing these technologies, students and professionals can acquire skills that are practical and directly applicable in today's IT environments.

Certifications are increasingly recognised as a valuable means to stay competitive in the mainframe space. Popular certifications such as IBM's z/OS Mainframe Practitioner Professional Certificate focus on foundational skills, while advanced certifications in AI integration, cloud computing, and cybersecurity are now also available. BMC's AMI for Security certification, for instance, is gaining popularity as companies prioritise secure, AI-enhanced mainframe operations to safeguard sensitive data.

Investing in mainframe education is essential to equip the next generation of IT professionals with the skills to harness the full potential of mainframes in the age of AI. Through advanced curriculums, strategic partnerships, and cutting-edge certifications, we can ensure that our talent pool is prepared for the challenges and opportunities of a Hybrid IT landscape. As AI and mainframes continue to converge, creating adaptable, skilled professionals will be key to driving both organisational resilience and innovation.

The writer is Vice President, Mainframe Service Delivery.

ON THE SHELF

Takeover: Hitler's Final Rise to Power
Author: Timothy W. Ryback
Publisher: Hachette India
Price: ₹999

In the summer of 1932, the Weimar Republic was on the verge of collapse. Hitler's National Socialists surged at the polls. Paul von Hindenburg, an ageing war hero, was a reluctant president bound by oath to uphold the constitution. The November elections offered Hitler the prospect of a Reichstag majority and the path to political power. But instead, the Nazis lost two million votes. As financial backers withdrew, the Nazi Party threatened to fracture. Hitler talked of suicide. Yet somehow, in a few brief weeks, he was chancellor of Germany. The book narrates the story of Hitler's dismantling of democracy through democratic process and more.